



Presented to:

MANPRINT Practitioners Workshop

MANPOWER ESTIMATE DEVELOPMENT PROCESS



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Army RDECOM, ATTN: AMSRD-AMR.*

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Presented by:

James Minninger

Human Factors Specialist

U.S. Army Research Laboratory

Human Research and Engineering Directorate

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➤ Describe Manpower Estimate Process:

- Background
- Guidance
- Timelines
- Basic Process
- Approval Process
- Technical Approach
- Internal Coordination
- External Coordination



Manpower Estimate:



- **Provides Manpower Requirements Estimates Associated with the Operation, Maintenance, Support, and Training Related to a System**
- **Presents Estimates by Personnel Type (Operators, Maintainers, Support Personnel, and Trainers) and Labor Category (Military, Department of Defense (DoD) Civilian, and Contractor)**
- **Presents Estimates by Fiscal Year from Program Initiation to Through Final System Retirement**
- **Addresses Comparison of Estimates with the Pool of Resources Available from Predecessor System(s)**
- **Addresses Source of Manpower “Bill-Payers” if the System Represents a New, Additional Capability**

Manpower Estimate Required by Title 10, USC

Manpower Estimates are required by *Title 10, Subtitle A, Part IV, Chapter 144, § 2434*, Independent cost estimates; **operational manpower requirements**.

(a) Requirement for Approval.— The Secretary of Defense may not approve the system **development and demonstration**, or the **production and deployment**, of a **major defense acquisition program** unless an independent estimate of the full life-cycle cost of the program and **a manpower estimate for the program** have been considered by the Secretary.

(1) . . .

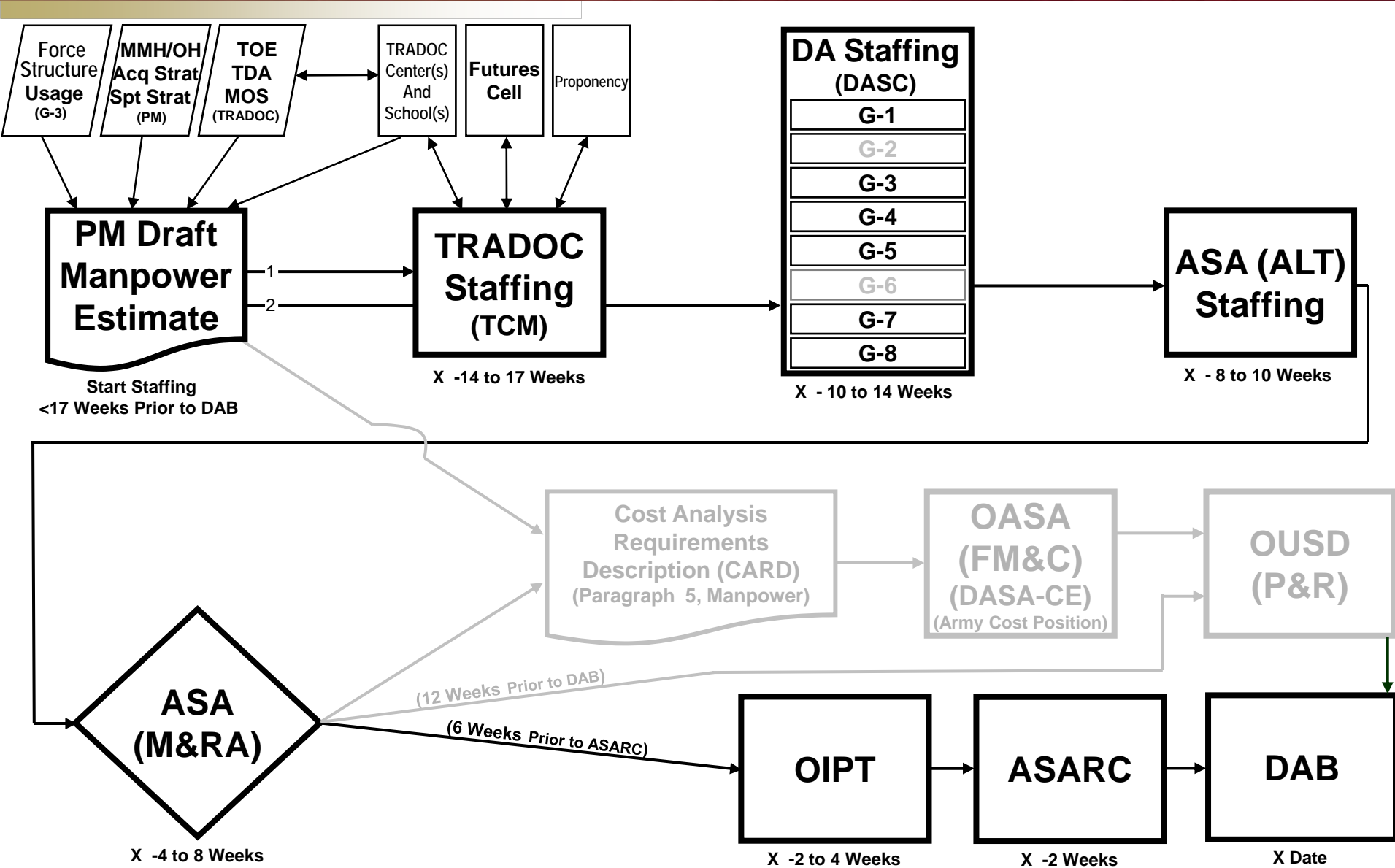
(2) that the **manpower estimate** include an estimate of the total number of personnel **required**—

(A) to **operate, maintain, and support the program** upon full operational deployment; and

(B) to **train personnel** to carry out the activities referred to in subparagraph (A).

- **Under Secretary of Defense for Personnel and Readiness (USD P&R) Memo (10 Dec 03)**
 - **Manpower Estimates Shall be Documented in Program Cost Analysis Requirements Description (CARD)**
 - ***Service - Approved* MER Required *Before* Overarching Integrated Product Team (OIPT)**
- **OSD Strategic Manpower Management (SMM) Initiative**
 - **MER Official Source for All Program Manpower Requirements, Total Ownership Cost Manpower Estimates, and DoD Strategic Manning Forecasts / Planning**
- **MER Now Required for Program Low Rate Initial Production (LRIP) Decision with Update at Full Rate Production (FRP)**
 - **System Developmental Test Results**
 - **“Cradle to Grave” Manning for System Aging / Engineering Change Proposals (ECP) Impacts**
 - **Coding for System Military, Civilian and Contractor Manpower Mix Criteria**
- **Separate MER for Each Development Block / Increment / Spiral**

Generic Manpower Estimate Development & Staffing Timeline



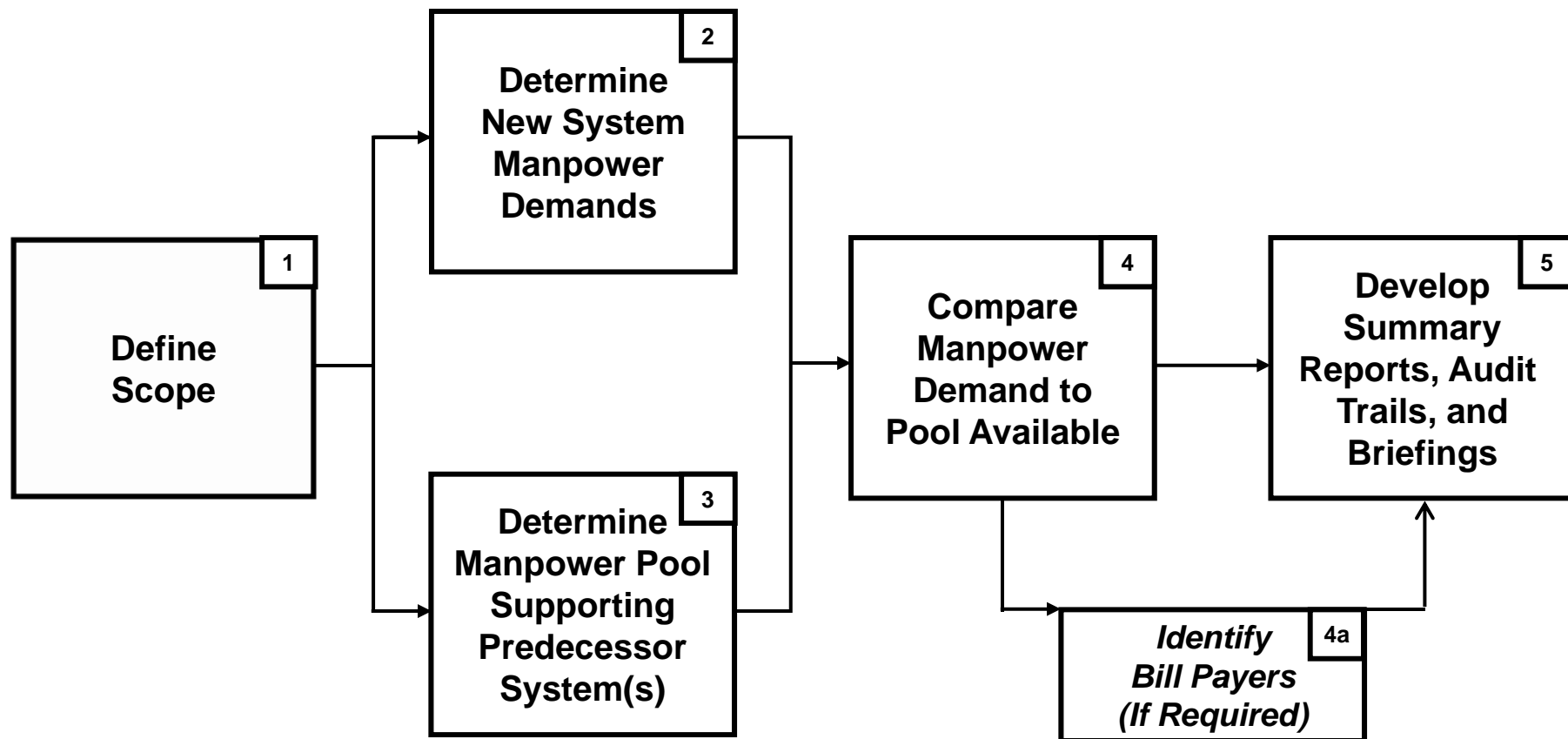


MER Development is Based on:

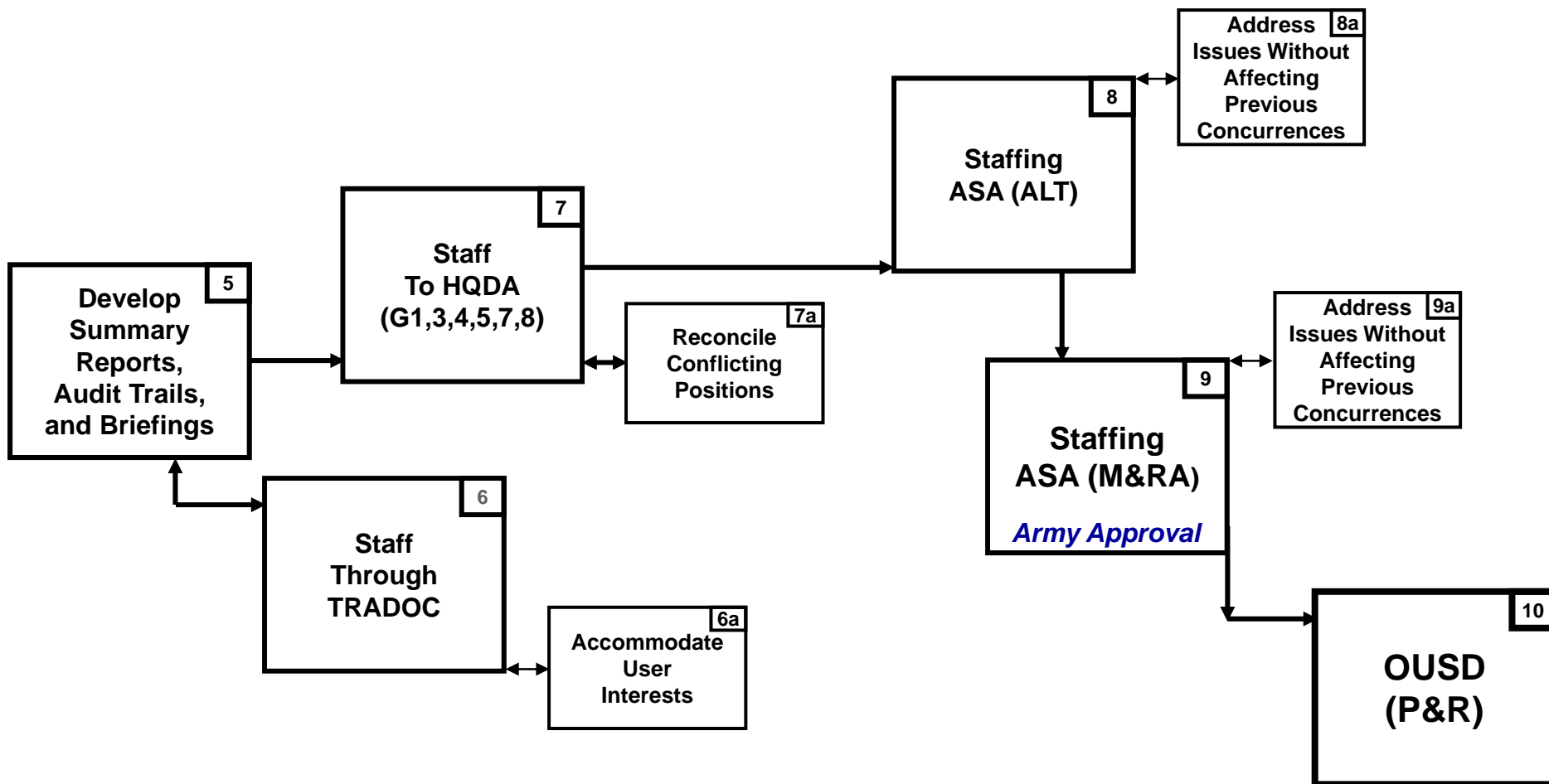


- **System Characteristics**
 - Performance Characteristics (Requirements)
 - Physical Characteristics (Requirements)
 - Reliability, Availability, and Maintainability
 - Advanced Technologies / Materials
- **Operating Concept**
 - Basing and Deployment
 - Inventory and Operational Tempo
 - Organizational / Unit Structure
- **Support Concept**
 - Supply and Maintenance Levels / Strategy
 - Interim Contractor Support
 - Software Support Strategy
 - Training Concept
- **Program Schedules**
 - Production and Deliveries
 - Operation and Support Phasing

Basic Manpower Estimate Development Process

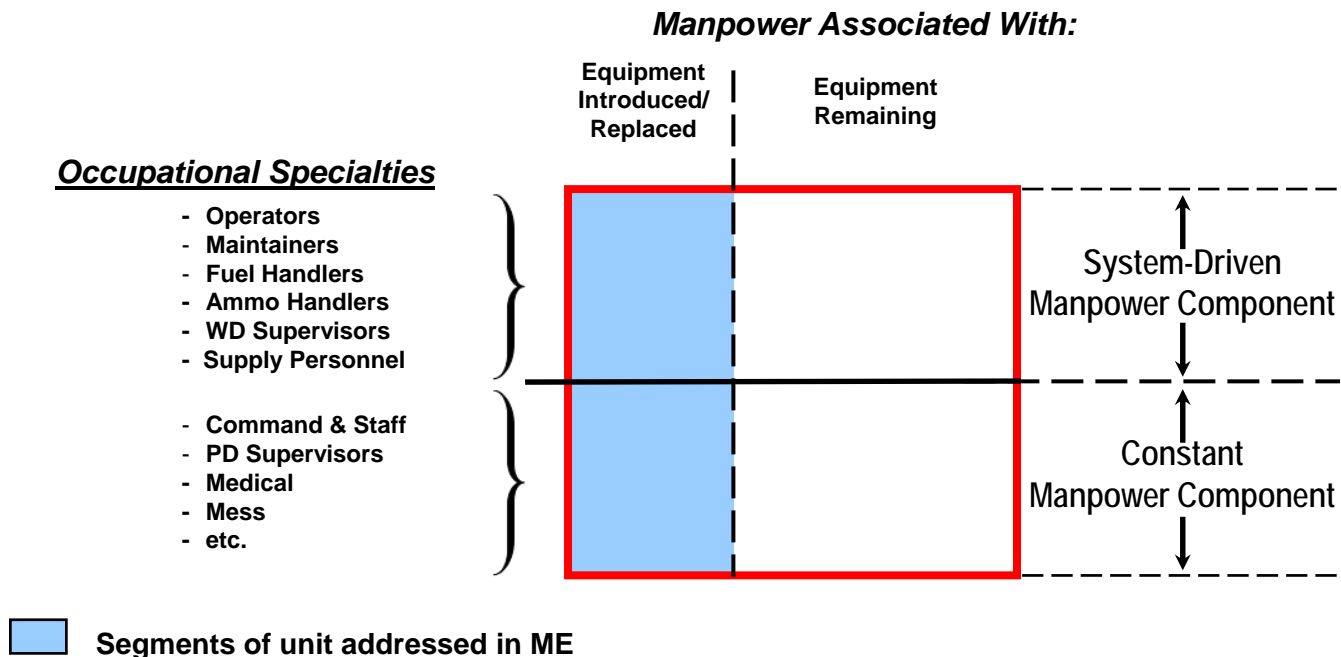


Basic Manpower Estimate Approval Process



Primary Systems vs. Secondary or Support Systems

- For Primary Systems, Where the Unit Exists Because of the System, All of the Manpower Within the Unit is Counted
- For Secondary or Support systems, i.e. HMMWVs in an Apache Unit, Only the System's "Fair Share" of the Unit Manpower is Counted



Manpower Authorizations Requirements Criteria (MARC) Workload Driven Manpower

$$MPRQ_{ijk} = \frac{MR_{ij} * OpTempo_{jk}}{IPC_k} * D_{jk}$$

Where:

- $MPRQ_{ijk}$ = Manpower requirement for MOS_i maintaining System j in unit k
- MR_{ij} = Maintenance ratio in man-hours per operating parameter for MOS_i supporting System j
- $OpTempo_{jk}$ = Operating hours per system per year for System j in unit k
- IPC_k = Individual productive capacity (same as Annual Available Productive Man-Hours (AAPMH)) in man-hours per year for a maintainer working in unit k
- D_{jk} = Density of systems type j in unit k

Workload Driven Manpower

$$MPRQ_{ijk} = \frac{MR_{ij} * OpTempo_{jk}}{IPC_k} * D_{jk}$$

Diagram illustrating the calculation of Maintainers Required Per Unit (MPRQ) using the formula:

$$38.85 = \frac{4.50 * 2.23}{6.20} * 24$$

Labels and arrows indicating the components of the formula:

- Maintainers Required Per Unit** (Red text) points to the result **38.85** (circled in red).
- MMH / FH** (Blue text) points to the numerator value **4.50**.
- FH / Day** (Blue text) points to the numerator value **2.23**.
- Acft / Unit** (Blue text) points to the multiplier **24**.
- DADPMH / Soldier** (Blue text) points to the denominator value **6.20**.

MMH / FH - Maintenance Man-Hours per Flight Hour

FH / Day - Flight Hours per Day per Aircraft

Acft / Unit - Aircraft per Unit

DADPMH / Soldier - Daily Available Direct Productive Man-Hours per Soldier



Maintainers Per Unit - By MOS



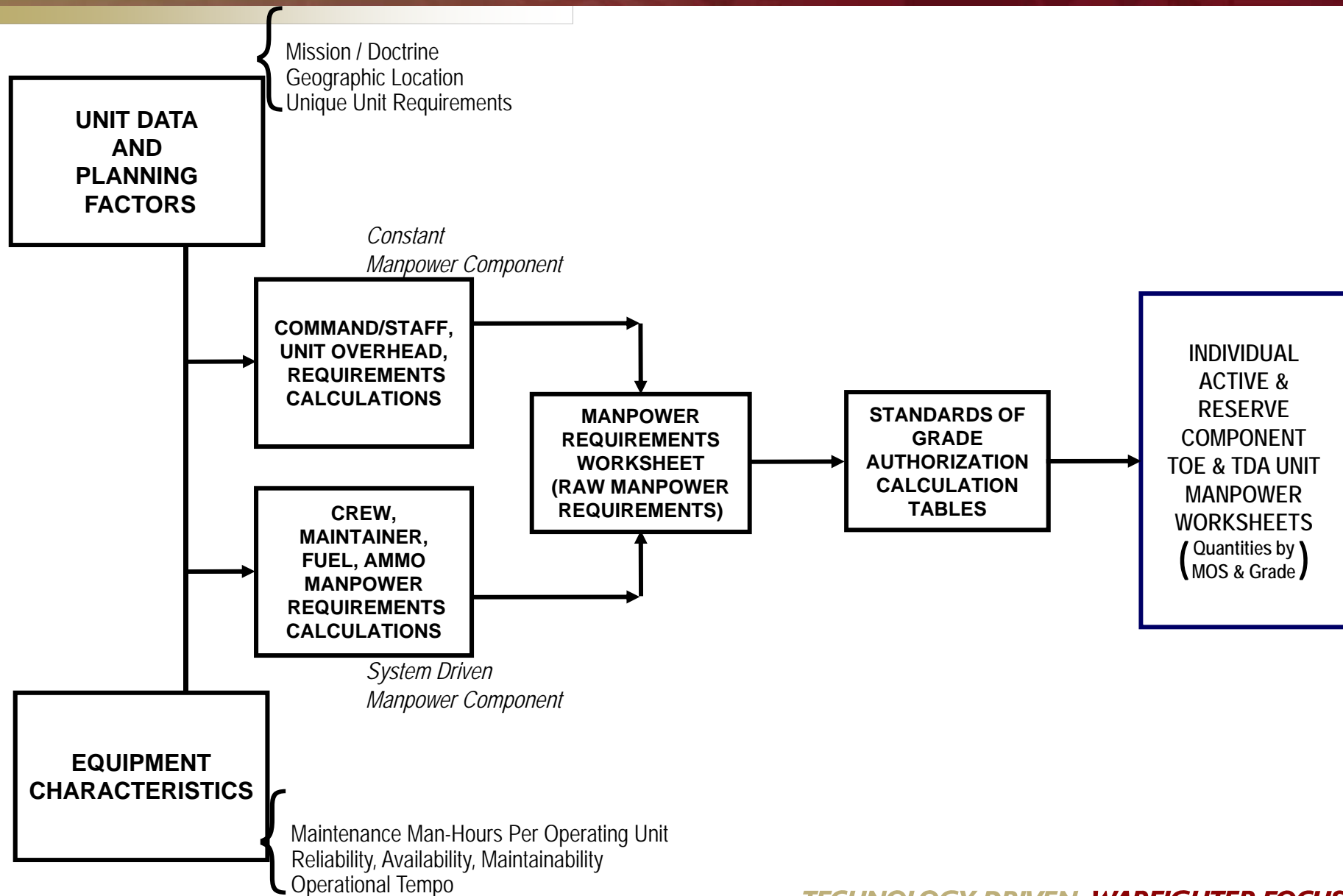
Maintenance Manpower by MOS

	MOS	MMH / FH	FH / Day / Acft	Total Aircraft Per Unit	DADPMH / Soldier	Total	Rounded Total	
Aircraft Repairer	15S	1.856	2.23	24	6.20	16.02	17	
Aircraft Tech Inspector	15S	0.153	2.23	24	6.20	1.32	2	
Electronics / Armament Repairer	15J	1.567	2.23	24	6.20	13.53	14	
Electronics / Armament Tech Inspector	15J	0.129	2.23	24	6.20	1.11	2	
Turbine Engine Repairer	15B	0.288	2.23	24	6.20	2.49	3	
Powertrain Repairer	15D	0.156	2.23	24	6.20	1.35	2	
Pneudraulics Repairer	15H	0.089	2.23	24	6.20	0.77	1	2
Airframe Repairer	15G	0.192	2.23	24	6.20	1.66	2	
Systems Tech Inspector	15K	0.070	2.23	24	6.20	0.60	1	2
TOTAL MMH/FH Requirement		4.500				39	44	46

MMH / FH = Maintenance Man Hours Per Flight Hour

DADPMH / FH = Dailey Available Direct Productive Man Hours Per Flight Hour

Individual TOE & TDA Unit Manpower Worksheets





Individual TOE & TDA Unit Manpower Worksheets



TOE Units

Go To War
Combat Units

Primary
Operational
Units

Headquarters
and
Controlling
Units

Maintenance,
Supply, and
Support
Units

TDA Units

Support
Mission or
Function Units

U.S. Army
Training and
Doctrine
Command
(TRADOC)

Operator
Training
School and
Center

Maintainer
Training
School(s) and
Center(s)

Support
Personnel
Training
School(s) and
Center(s)

U.S. Army
Materiel
Command
(AMC)

Major
End Item
Depot

Electronics
Systems
Depot

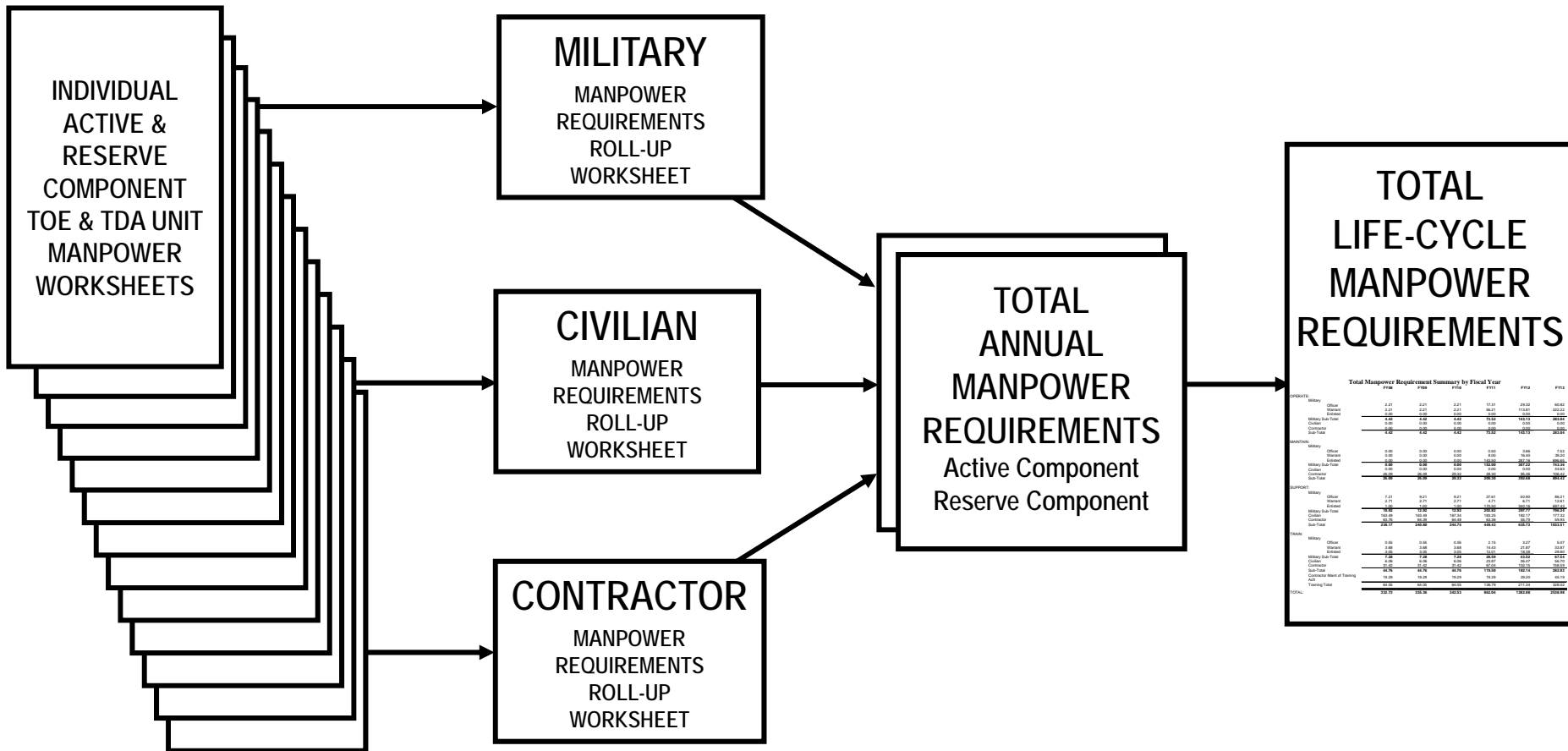
Life-Cycle
Management
Command

Original
Equipment
Manufacturer

Program
Executive
Office

Program /
Product /
Project
Management
Office

Unit Manpower Worksheets to Life-Cycle Manpower Requirement





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Typical Manpower Estimate Report Summary Table



Total Manpower Requirement Summary by Fiscal Year

	FY08	FY09	FY10	FY11	FY12	FY13
OPERATE:						
Military						
Officer	2.21	2.21	2.21	17.31	29.32	60.82
Warrant	2.21	2.21	2.21	56.21	113.81	222.22
Enlisted	0.00	0.00	0.00	0.00	0.00	0.00
Military Sub-Total	4.42	4.42	4.42	73.52	143.13	283.04
Civilian	0.00	0.00	0.00	0.00	0.00	0.00
Contractor	0.00	0.00	0.00	0.00	0.00	0.00
Sub-Total	4.42	4.42	4.42	73.52	143.13	283.04
MAINTAIN:						
Military						
Officer	0.00	0.00	0.00	0.50	3.66	7.52
Warrant	0.00	0.00	0.00	8.00	16.40	39.20
Enlisted	0.00	0.00	0.00	143.50	287.16	696.65
Military Sub-Total	0.00	0.00	0.00	152.00	307.22	743.36
Civilian	0.00	0.00	0.00	0.00	0.00	44.63
Contractor	26.09	26.09	29.32	48.30	85.46	106.42
Sub-Total	26.09	26.09	29.32	200.30	392.68	894.42
SUPPORT:						
Military						
Officer	7.21	9.21	9.21	27.61	50.90	86.21
Warrant	2.71	2.71	2.71	4.71	6.71	12.61
Enlisted	1.00	1.00	1.00	170.50	340.16	697.43
Military Sub-Total	10.92	12.92	12.92	202.82	397.77	796.24
Civilian	163.49	163.49	167.34	183.25	182.17	177.32
Contractor	63.76	64.39	64.48	63.36	55.79	59.95
Sub-Total	238.17	240.80	244.74	449.43	635.73	1033.51
TRAIN:						
Military						
Officer	0.55	0.55	0.55	2.15	3.27	5.07
Warrant	3.68	3.68	3.68	14.43	21.87	33.87
Enlisted	3.05	3.05	3.05	12.01	18.38	28.60
Military Sub-Total	7.28	7.28	7.28	28.59	43.52	67.54
Civilian	6.06	6.06	6.06	23.87	36.47	56.70
Contractor	31.42	31.42	31.42	67.04	102.15	158.59
Sub-Total	44.76	44.76	44.76	119.50	182.14	282.83
Contractor Maint of Training Acft	19.29	19.29	19.29	19.29	29.20	45.19
Training Total	64.05	64.05	64.05	138.79	211.34	328.02
TOTAL:	332.73	335.36	342.53	862.04	1382.88	2538.98

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- **Capabilities Development Document (CDD)**
 - MER Based on CDD Requirements (MS B)
- **Cost Analysis Requirements Description (CARD)**
 - MER and CARD Manpower Consistent
- **Basis of Issue Plan (BOIP)**
 - MER and BOIP Manpower Consistent
- **System Training Plan (STRAP)**
 - STRAP Manpower, Personnel, Student Through-Put, and Training Criteria Used for MER Development

- **User (TRADOC Capabilities Manager) Coordination is Essential Prior to HQDA Staffing**
- ***The Program's Department of the Army Systems Coordinator (DASC) is the Single Most important Person in DA Staffing***
 - **He / She Must Ensure Personal Coordination and Walk the MER Through Each G-Staff and Approving Office**
- **All Issues, Raised by Anyone, Must be Immediately Addressed and Changes Effected**

Questions Comments

BACK-UPS

- **There Should be no increase in total Army manpower**
 - **Soldiers, DoD Civilians, and Contract Man-Years Supporting the Current Systems and Processes being Replaced / Displaced / Changed will be Available to Meet Operation, Maintenance, and Support Manpower Requirements**
 - **If Additional Soldiers are Required, Bill-Payer(s) from Within the Current Force Structure MUST be Identified**
- **MARC Process for Workload Driven Manpower**
- **MER Based on CDD Requirements at MS B**
- **MER Based on Requirements, Engineering Estimates, and Existing Empirical Data at MS C / LRIP**
- **MER Based Only on Analysis of Empirical Data at FRP**



Basic Data Requirements



- **Modernization System Defined (as well as possible)**
- **Predecessor System(s) Identified**
- **Force Structure Identified**
 - **Active Component Units**
 - **Number of Systems**
 - **Reserve Component Units**
 - **Number of Systems in:**
 - **National Guard Units**
 - **Army Reserve Units**
- **Wartime Operational Concept**
 - **Operational Tempo**
 - **Support Concept**
 - **Maintenance Concept**
 - **Training Concept**



Basic Data Requirements (Cont.)



- **Crew Size**
- **Crews Per System**
- **Peacetime Operational Concepts**
- **System-Specific Performance Factors**
 - **Reliability, Availability, and Maintainability (RAM) Characteristics**
 - Maintenance Man-Hours Per Operating Hour
 - Operational Availability Requirements
 - Mean Time To Repair
 - Max Time To Repair
 - Average Maintenance Crew Size
- **Product Office and TRADOC Capabilities Manager Manpower by:**
 - **Man-Years Per Fiscal Year**
 - Military (Officers, Warrants, Enlisted)
 - DoD Civilians (Assigned and Matrix)
 - Contractors



Basic Data Requirements (Cont.)



- **Fuel Handler Requirements based on Consumption Rates**
- **Ammunition Handler Requirements based on Consumption Rates**
- **Depot Manpower**
 - Generic Manpower Requirements
 - Organic Depot Support
 - Contractor Logistics Support
 - Performance Based Logistics
 - Predecessor Manpower Based on OSMIS Data Base
 - Research data with each depot
- **Training Manpower**
 - Based on the Latest COEA / CTEA / TIA (if available)
 - TRADOC Training Related Data for Each MOS